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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/730,759	12/08/2003	Philip H. Mellor	130209.491	3454

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EXAMINER

PRESTON, ERIK D

ART UNIT PAPER NUMBER

2834

DATE MAILED: 11/17/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.		Applicant(s)	
	10/730,759		MELLOR ET AL.	
	Examiner		Art Unit	
	Erik D. Preston		2834	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 August 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 2-6, 8, 9, 11, 14-16 and 26-44 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 2-6, 8, 9, 11, 14-16 and 26-44 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date: _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date: _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

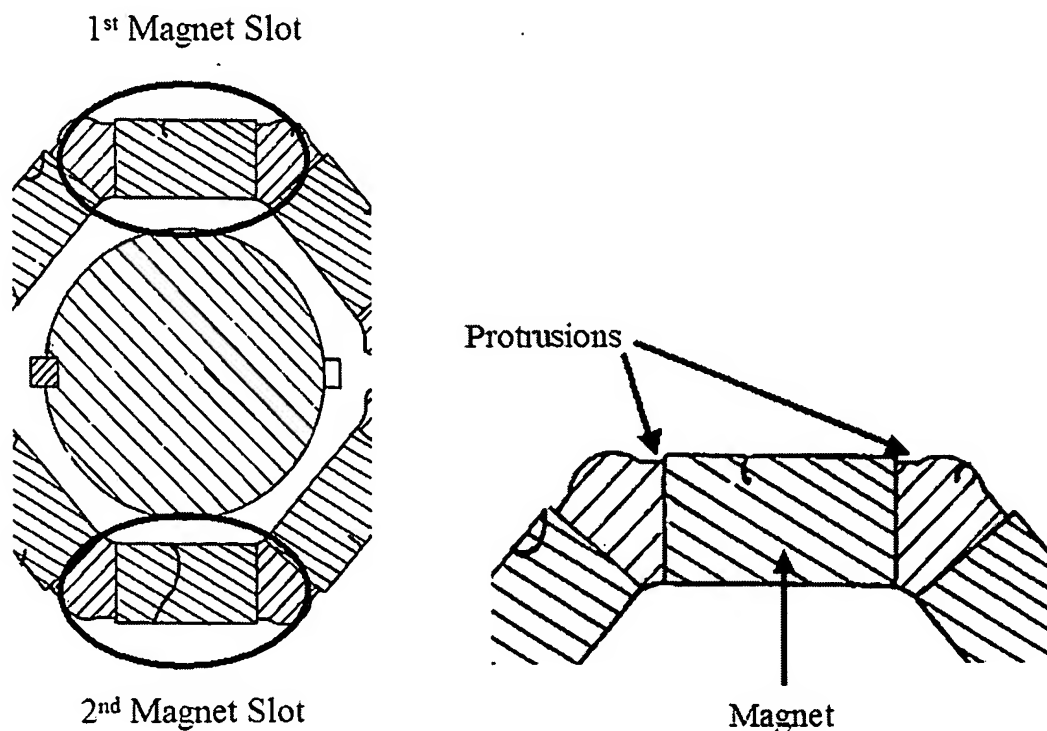
(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 15, 16, 26 & 32-34 are rejected under 35 U.S.C. 102(b) as being anticipated by Steen (US 4139790 previously cited).

With respect to claim 15, Steen teaches an electric machine comprising: A stator (as seen in Fig. 3, #14); and a rotor (Fig. 9, #93) mounted for rotation with respect to the stator, a plurality of magnetic slots (Fig. 9, #101 & 102 & Fig. Below) separated from each other by at least a portion of a lamination layer each slot comprising opposed end portions (Fig. 9, #117) and a central portion disposed between the end portions, the central portion of each of the magnet slots shaped to complementarily receive a magnet, the opposed end portions separated from the central portion by portions of the rotor that protrude at least partially into the slot (as seen in Fig. below) wherein the end portions of the magnet slots are substantially bulbous-shaped (as seen in Fig. 9, the end portions are bulbous); a number of magnets (Fig. 9, #103) complementarily received in the central portions of the magnet slots of the rotor; and a load absorbing material filling

at least a portion of each of the end portions of the magnet slots, the permanent magnet being substantially, laterally restrained in the slot by the portion of the rotor that protrudes at least partially into the slot.

With respect to claim 16, Steen teaches the machine of claim 14, wherein the end portions of the magnet slots have a width greater than a width of the central portion of the magnet slots (as seen in Fig. 9).



With respect to claim 26, Steen teaches a rotor assembly of an electric machine comprising: a lamination layer configured to be axially stacked in a series of lamination layers (as seen in Fig. 2) to form a rotor core of an electric machine; a plurality of slots separated from each other by at least a portion of the lamination layer (as seen in the

Fig. above), each slot comprising opposed end portions (Fig. 9, #117) and an elongate portion disposed between the end portions, and at least one of the end portions is expanded bulbous-shaped (both end portions are bulbous shaped); a portion of the lamination layer (as seen in the Fig. above) protruding at least partially into the internal slot between the elongate portion and the at least one expanded bulbous end portion; a permanent magnet (Fig. 9, #103) disposed within each internal slot and substantially laterally restrained in the slot by the portion of the lamination layer; and a load absorbing material received in the end portions of the internal slots between a portion of a wall forming a the end portion and the respective permanent magnet disposed in the internal slot.

With respect to claim 32, Steen teaches the machine of claim 15, wherein one of the respective magnets complementarily received in the central portion of one of the respective magnet slots of the rotor is laterally restrained by the portions of the rotor that protrude at least partially into the one of the magnet slots.

With respect to claims 33 & 34, Steen teaches the machine of claims 15 & 26 wherein the portions of the rotor that protrude at least partially into the slot comprise notches.

Claims 39-44 are rejected under 35 U.S.C. 102(e) as being anticipated by Gary et al. (US 6946766).

With respect to claim 39, Gary teaches a magnet slot residing in a laminate layer of an electric machine comprising: a first end portion (Fig. 15B, #161) that is substantially bulbous-shaped; a second end portion (Fig. 15B, #161); and a central

portion disposed between the first end portion and the second end portion, the central portion shaped to complimentary receive a magnet (as seen in Fig. 15A).

With respect to claim 40, Gary teaches the magnet slot of claim 39, wherein the second end portion is substantially bulbous-shaped.

With respect to claim 41, Gary teaches the magnet slot of claim 39, wherein the first end portion is a bulbous-shaped cavity.

With respect to claim 42, Gary teaches a laminate layer of an electrical machine comprising: a plurality of magnet slots disposed in the laminate layer, wherein each of the plurality of magnet slots comprises: a substantially bulbous-shaped first end portion (Fig. 15B, #161); a substantially bulbous-shaped second end portion (Fig. 15B, #161); and a central portion (as seen in Fig. 15A) shaped to complementarily receive a magnet; and a plurality of laminate layer portions, one laminate layer portion between two adjacent magnet slots (as seen in Fig. 15B).

With respect to claims 43 & 44, Gary teaches the machine of claim 42, further comprising a non-magnetic filler material (air) residing in the first end portion and the second end portion.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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Claims 2-6,8,9,11,14,15,26-31 & 35-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kliman (US 5159220 previously cited) in view of Steen (US 4139790 previously cited).

With respect to claims 8,35 & 36, Kliman teaches a stator (Col. 8, Lines 28-30); and a rotor core (Fig. 1, #10) extending in a longitudinal and radial direction, the rotor core mounted for rotation around a longitudinal axis with respect to the stator, a number plurality of magnetic slots (two of Fig. 4, #52, located in opposite quadrants of the rotor) wherein the magnet slots are arranged to be substantially perpendicular with the radial direction (they extend in the axial direction), and at least one non-magnetic bulbous structure (as seen in Fig. 4) formed at a rotor core internal location proximate to an expected pole location of a magnet emplaced in the magnet slot (Fig. 4, #14A-D); a filler forming at least a part of the at least one non-magnetic structure (as seen in Fig. 4), at least some of the filler located in the magnet slot, wherein the filler comprises epoxy (Col. 5, Lines 32-40), but it does not teach each of the number of the magnet slots segmented by a portion of the rotor core that protrudes at least partially into the magnet slot. However, Steen teaches a rotor core (Fig. 9, #93) with a number of magnets (Fig. 9, #103) held between a non-magnetic filler (Fig. 9, #117) wherein each of the number of the magnet slots are segmented by a portion of the rotor core that protrudes at least partially into the magnet slot (as seen in the Fig. above, and as described in Col. 8, Lines 45-47). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the magnet slot of Kliman in view of the protrusion as taught by

Steen because it provides a means for locating the magnets within the magnet slot (Steen, Col. 8, Lines 45-47).

With respect to claim 2, Kliman in view of Steen teaches the electric machine of claim 8, wherein each of the magnet slots comprises a portion having a shape in complimentary to a shape of at least a portion of the magnet.

With respect to claim 3, Kliman in view of Steen teaches the electric machine of claim 2, wherein the portion of the magnetic slot having a complimentary shape is elongated (as seen in Kliman Fig. 1 & Steen Fig. 9).

With respect to claims 4 & 37, Kliman in view of Steen teaches the electric machine of claims 8 & 35, and Kliman teaches that the at least one bulbous non-magnetic structure formed at a rotor core internal slot location proximate to an expected pole location of a magnet (Fig. 4, #14A-D) emplaced in the magnet slot comprises an end of the magnet slot abutting at least one non-magnetic region having a width in excess of a width of the magnet slot where at least a portion of the magnetic slot is substantially magnet shaped (as seen in Fig. 4).

With respect to claims 5 & 38, Kliman in view of Steen teaches the electric machine of claims 4 & 37, wherein the at least one non-magnetic region having a width in excess of a width of the magnet slot comprises a substantially bulbous region (as seen in Kliman Fig. 4 & Steen Fig. 9).

With respect to claim 6, Kliman in view of Steen teaches the electric machine of claim 5, and Steen teaches that the portion of the rotor core that protrudes at least

partially into the magnet slot is disposed between a substantially linear portion of the magnet slot and the substantially bulbous region (as seen in Fig. 9).

With respect to claim 9, Kliman in view of Steen teaches the electric machine of claim 8, further comprising: A number of permanent magnets, each of the permanent magnets disposed within a respective one of the magnet slots.

With respect to claim 11, Kliman in view of Steen teaches the electric machine of claim 9, further comprising: A number of non-magnetic wedges (Kliman Fig. 4 & Steen Fig. 9), each non-magnetic wedge disposed adjacent to a respective one of the permanent magnets to establish a movement resistant friction-fit between the permanent magnet and the magnet slot.

With respect to claim 28, Kliman in view of Steen teaches the electric machine of claim 8, and Steen teaches that at least one of the number of the magnet slots includes a cavity formed at the first end on the magnet slot, and where the cavity is separated from a remaining portion of the magnet slot by the portion of the rotor core that protrudes at least partially into the magnet slot (as seen in Fig. 9).

With respect to claim 29, Kliman in view of Steen teaches the electric machine of claim 28, wherein the cavity is a bulbous shaped cavity.

With respect to claim 30, Kliman in view of Steen teaches the electric machine of claim 8, and Steen teaches that the portion of the rotor core that protrudes at least partly into the magnet slot abuts a first end of the magnet that is located in the magnet slot (as seen in Fig. 9).

With respect to claim 31, Kliman in view of Steen teaches the machine of claim 8, and Steen teaches that the portion of the rotor core that protrudes at least partially into the magnet slot comprises a notch.

With respect to claim 15, Kliman teaches an electric machine comprising: A stator (Col. 8, Lines 28-30); and a rotor (Fig. 1, #10) mounted for rotation with respect to the stator, the rotor core comprising a plurality of magnetic slots (Fig. 1, #15A-D) separated from each other by at least a portion of a lamination layer, each slot comprising opposed end portions and a central portion disposed between the end portions, the central portion of each of the magnet slots shaped to complementarily receive a magnet, and at least one of the end portions is substantially bulbous-shaped (as seen in Fig. 1); a number of magnets complementarily received in the central portions of the magnet slots of the rotor; and a load absorbing material filling at least a portion of each of the end portions of the magnet slots, but it does not teach the opposed end portions separated from the central portion by portions of the rotor that protrude at least partially into the slot. However, Steen teaches opposed end portions separated from the central portion by portions of the rotor that protrude at least partially into the slot (as seen in the Fig. above). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the magnet slot of Kliman in view of the protrusion as taught by Steen because, as was stated above, it provides a means for locating the magnets within the magnet slot (Steen, Col. 8, Lines 45-47).

With respect to claim 14, Kliman in view of Steen teaches the electric machine of claim 15, Kliman teaches that wherein the load absorbing material comprises epoxy filler.

With respect to claim 26, Kliman teaches a rotor assembly of an electric machine, comprising: A lamination layer configured to be axially stacked in a series of lamination layers to form a rotor core of an electric machine comprising: a lamination layer (Col. 4, Lines 22-30) configured to be axially stacked in a series of lamination layers to form a rotor core of an electric machine; a plurality of magnet slots separated from each other by at least a portion of the lamination layer (as seen in Fig. 1), each slot comprising opposed end portions and an elongate portion disposed between the end portions, and at least one of the end portions is expanded bulbous shaped (as seen in Fig. 1); a permanent magnet disposed within each internal slot and substantially, laterally restrained in the slot; and a load absorbing material received in the end portions of the internal slots between a portion of a wall forming the end of portion and the respective permanent magnet disposed in the internal slot, but it does not teach a portion of the lamination layer protruding at least partially into the internal slot between the elongate portion and the at least one expanded bulbous end. However, Steen teaches a portion of a lamination layer protruding at least partially into an internal slot between an elongate portion and an at least one expanded bulbous end (as seen in the Fig. above). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the magnet slot of Kliman in view of the protrusion as taught by

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Steen because, as was stated above, it provides a means for locating the magnets within the magnet slot (Steen, Col. 8, Lines 45-47).

With respect to claim 27, Kliman in view of Steen teaches the rotor assembly of claim 26, and Kliman teaches that the load absorbing material is epoxy.

Response to Arguments

Applicant's arguments filed 8/24/2006 have been fully considered but they are not persuasive.

In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., that the end portions are not common or shared with other magnet slots) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

In response to the applicant's argument that the end portions as taught by either Steen or Kliman are not bulbous-shaped, it is noted that the end portions of both Steen and Kliman are round or have a shape similar to that of a bulb.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US 4486679

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).


A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Erik D. Preston whose telephone number is (571)272-8393. The examiner can normally be reached on Monday through Friday 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Darren Schuberg can be reached on (571)272-2044. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



11/07/2006



BURTON S. MULLINS
PRIMARY EXAMINER